

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Clarence E. Thomas et al.  
Serial No.: 10/661,175  
Date Filed: September 12, 2003  
Group Art Unit: 2877  
Confirmation No.: 7513  
Examiner: Lee, Hwa S.  
Title: **OPTICAL ACQUISITION SYSTEMS FOR  
DIRECT-TO-DIGITAL HOLOGRAPHY AND  
HOLOVISION**

**MAIL STOP - AF**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**REQUEST FOR CONTINUED EXAMINATION AND AMENDMENT**

In response to the Final Office Action mailed October 5, 2006, Applicants respectfully submit the following amendments set forth below and request favorable action thereon.

**Amendments to Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks/Arguments** begin on page 4 of this paper.

**CLAIM AMENDMENTS**

**IN THE CLAIMS**

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. **(Currently Amended)** A direct-to-digital holography system, comprising:  
an illumination lens operable to focus a reference beam;  
a beam splitter optically coupled to the illumination lens by the reference beam; and  
a reference mirror located at a waist of the reference beam ~~such that the reference mirror replaces to eliminate the need for~~ a reference objective on a reference arm.
2. (Original) The system of Claim 1, wherein the beam splitter comprises a cube beam splitter operable to eliminate first order reflections.
3. (Original) The system of Claim 1, further comprising a quarter-wave plate optically coupled between the beam splitter and the reference mirror.
4. (Original) The system of Claim 1, wherein the reference beam comprises a Gaussian beam.
5. (Original) The system of Claim 1, wherein the reference mirror comprises a flat mirror.
6. (Previously Presented) The system of Claim 1, further comprising the reference mirror operable to maintain optical symmetry of the reference arm and a target arm.
7. (Original) The system of Claim 1, further comprising the reference mirror operable to form a first wavefront substantially similar to a second wavefront formed by the reference objective.

8. (Currently Amended) A method for acquiring a complex image in a direct-to-digital holography system, comprising:

focusing a reference beam with an illumination lens, the reference beam including a waist;

transmitting at least a portion of the reference beam through a beam splitter; and

reflecting the portion of the reference beam from a reference mirror located at the waist of the reference beam, the reference mirror ~~replacing eliminating the need for~~ a reference objective on a reference arm.

9. (Cancelled)

10. (Previously Presented) The method of Claim 8, further comprising forming a combined wavefront at a digital recorder, the wavefront substantially similar to a wavefront produced by the reference objective.

11. (Previously Presented) The method of Claim 8, further comprising the reference mirror operable to maintain optical symmetry of the reference arm and a target arm.

12. (Original) The method of Claim 8, wherein the reference beam comprises a Gaussian beam.

13-32. (Cancelled)

33. (Previously Presented) The method of Claim 8, further comprising the reference mirror operable to form a first wavefront substantially similar to a second wavefront formed by the reference objective.

34. (Previously Presented) The method of Claim 8, wherein the reference mirror comprises a flat mirror.

**REMARKS**

Applicants have carefully reviewed this Application in light of the Final Office Action mailed October 5, 2006. Claims 13-32 were previously cancelled without prejudice or disclaimer due to an election/restriction requirement. Claim 9 was previously cancelled without prejudice or disclaimer and Claims 1-8, 10-12, 33 and 34 are pending in this Application. Claims 1-3 and 5-11 stand rejected under 35 U.S.C. § 112, Claims 1-8 and 10-12 stand rejected under 35 U.S.C. § 103(a), and the Examiner has not indicated any disposition of Claims 33 and 34. Claims 1 and 8 have been amended to further define various features of Applicants' invention. Applicants respectfully request reconsideration and favorable action in this case.

**Rejections under 35 U.S.C. § 112**

Claims 1-3 and 5-11 stand rejected by the Examiner under 35 U.S.C. § 112, second paragraph, as being indefinite and failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Examiner alleges that because claims recite a reference mirror "replacing" a reference objective, it is unclear how the reference mirror replaces the reference object. Applicants have amended Claim 1 and 8 to recite a reference mirror that eliminates "the need for a reference objective." Applicants respectfully request withdrawal of the rejections under 35 U.S.C. 112, second paragraph and full allowance of Claims 1-3 and 5-11 as amended.

**Rejections under 35 U.S.C. § 103**

Claims 1-3 and 5-11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0145773 by Satoru Tanaka et al. ("Tanaka").

Claims 4 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Tanaka* as applied to Claims 1 and 8 above, and further in view of U.S. Patent No. 6,781,725 issued to Marko Zgonik ("Zgonik").

*Tanaka* discloses a hologram recording method and an optical information recording and reproducing apparatus utilizing the holographic memory. A rotatable plane mirror is arranged on an opposite side of a recording medium from a recording reference light beam.

(Paragraph 82). At a reproducing time, the plane mirror is fixed such that the mirror is opposed to the recording reference light beam passing through the recording medium and at a recording time, the plane mirror is rotated such that the recording reference light beam is guided to a light absorber. (Paragraph 82).

*Zgonik* discloses a storage method and system for storing mutually non-overlapping volume holograms.

Claim 1, as amended, recites “a reference mirror located at a waist of the reference beam to eliminate the need for a reference objective on a reference arm.”

Claim 8, as amended, recites a method comprising the step of “reflecting the portion of the reference beam from a reference mirror located at the waist of the reference beam, the reference mirror eliminating the need for a reference objective on a reference arm.”

Applicants respectfully submit that the cited reference fails to disclose every element of Applicants’ invention as amended. *Tanaka* fails to teach at least a direct-to-digital holography system comprising “a reference mirror located at a waist of the reference beam to eliminate the need for a reference objective on a reference arm,” as recited by amended Claim 1. Additionally, *Tanaka* fails to teach a method for acquiring a complex image in a direct-to-digital holography system including the step of “reflecting the portion of the reference beam from a reference mirror located at the waist of the reference beam, the reference mirror eliminating the need for a reference objective on a reference arm,” as recited by amended Claim 8.

The Examiner acknowledges that *Tanaka* does not expressly disclose eliminating “the need for a reference objective on a reference arm” but argues that “the intention of using a reference mirror to replace a reference objective does not further define the structure of the system.” (Office Action, Page 3) (emphasis in original). Claims 1 and 8, however, do not express an intention but recite that the reference mirror eliminates “the need for a reference objective on a reference arm.” (emphasis added). *Tanaka* does not expressly or inherently disclose this limitation.

For at least the reasons set forth above, *Tanaka* fails to disclose the recited limitations and cannot render obvious Claims 1 and 8. Given that Claims 2-7 depend from Claim 1, and Claims 10-12 depend from Claim 8, Applicants respectfully submit that Claims 2-7 and 10-12 are allowable. As such, Applicants respectfully request that the Examiner withdraw the rejections under 35 U.S.C. § 103(a) and allow Claims 1-8 and 10-12.

**Disposition of Claims 33 and 34**

In the Office Action, the Examiner does not indicate or discuss any disposition of Claims 33 and 34. However, while the Applicants make no concessions regarding Claims 33 and 34, Applicants submit that Claims 33 and 34 are allowable because they provide further patentable limitations to Claim 8, shown to be allowable above. Accordingly, Applicants respectfully request that the Examiner allow Claims 33 and 34.

In addition, because the Examiner did not formally reject Claims 33 and 34, or provide any reasons for rejection of Claims 33 and 34 in the Office Action, Applicants submit that the Office Action was not properly made final under M.P.E.P. § 706.07(a). Accordingly, Applicants submit that the final rejection is premature, and the finality of the Office Action should be withdrawn pursuant to M.P.E.P. § 706.07(c) and (d).

**Request for Continued Examination (RCE)**

Applicants respectfully submit herewith a Request for Continued Examination (RCE) Transmittal and authorize the Commissioner to charge the filing fee of \$395.00 to Deposit Account No. 50-2148 of Baker Botts L.L.P.

**Information Disclosure Statements**

Applicants would like to bring to the Examiner's attention that the Examiner made no indication that the References submitted with Information Disclosure Statement and PTO Form 1449 filed on September 12, 2003, had been considered in Office Actions mailed March 14, 2006 and October 5, 2006. Applicants respectfully request confirmation of the consideration of the References. Applicants attach a copy of the PTO Form 1449 that was attached to the Office Action mailed March 14, 2006, and respectfully request that the Examiner place his initials next to the References if citation is to be considered or draw a line through the citation if the citation is not to be considered.

**CONCLUSION**

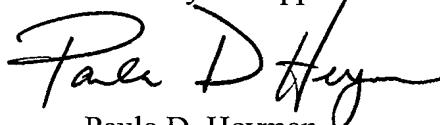
Applicants appreciate the Examiner's careful review of the application. Applicants have now made an earnest effort to place this case in condition for allowance in light of the amendments and remarks set forth above. For the foregoing reasons, Applicants respectfully request reconsideration of the rejections and full allowance of Claims 1-8, 10-12, 33 and 34, as amended.

Applicants respectfully submit herewith a Petition for a 3-Month Extension of Time and hereby authorize the Commissioner to charge \$510.00 for this fee to Deposit Account No. 50-2148 of Baker Botts L.L.P. In addition, Applicants authorize the Commissioner to charge \$395.00 for the Request for Continued Examination fee. Applicants believe no additional fees are due, however the Commissioner is hereby authorized to charge any additional fees necessary or credit any overpayment to Deposit Account No. 50-2148 of Baker Botts L.L.P in order to effectuate this filing.

If there are any matters concerning this Application that may be cleared up in a telephone conversation, please contact Applicants' attorney at 512.322.2581.

Respectfully submitted,

BAKER BOTTS L.L.P.  
Attorney for Applicants



Paula D. Heyman  
Reg. No. 48,363

Date: April 4, 2007

**SEND CORRESPONDENCE TO:**

Customer No. **31625**  
512.322.2581  
512.322.8328 (fax)

Enclosures: 1) Copy of PTO 1449 Forms filed with IDS on 9/12/03 and 4/2/04.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Clarence E. Thomas, et al.  
Date Filed: September 12, 2003  
Title: *Optical Acquisition Systems for Direct-to-Digital Holography and Holovision*

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

I hereby certify that this Information Disclosure Statement is being deposited with the United States Postal Service as Express Mail No. EV341125873US addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Shannon Judic  
Shannon Judic  
9/12/03  
Date

Dear Sir:

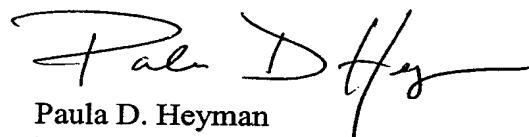
**INFORMATION DISCLOSURE STATEMENT**

Applicants respectfully request, pursuant to 37 C.F.R. §§1.56, 1.97 and 1.98, that the references listed on the attached PTO-1449 form be considered and cited in the examination of the above-identified application. Since the present Application was filed after June 30, 2003, a copy of any U.S. Patent and any U.S. Patent Application Publication cited on the attached PTO Form 1449 is not being submitted with this Information Disclosure Statement pursuant to the July 11, 2003 waiver of 37 C.F.R. § 1.98(a)(2)(i) by the U.S. Patent and Trademark Office.

Applicants believe no fees are due, however, the Commissioner is hereby authorized to charge any fees to Deposit Account No. 50-2148 of Baker Botts L.L.P. in order to effectuate this filing.

Respectfully submitted,

BAKER BOTTS L.L.P.  
Attorneys for Applicants



Paula D. Heyman  
Reg. No. 48,363

Date: Sept 12, 2003

Correspondence Address:

Customer No. **31625**

512.322.2581  
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PTO-1449 <b>Information Disclosure Citation in an Application</b>			Application No.  Not yet assigned	Applicant(s)  Clarence E. Thomas, et al.			
			Docket Number  068062.0168	Group Art Unit  Not Yet Assigned	Filing Date  September 12, 2003		
<b>U.S. PATENT DOCUMENTS</b>							
		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	A	6,525,821	02/25/03	Thomas et al.	356	457	01/04/00
	B	6,078,392	06/20/00	Thomas et al.	356	348	06/11/97
	C	2003/0048957 A1	03/13/03	Dai et al.	382	260	09/07/01
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<b>FOREIGN PATENT DOCUMENTS</b>							
		DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES      NO
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	N						
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<b>NON-PATENT DOCUMENTS</b>							
		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)					DATE
	P	U.S. Patent Application Serial No. 09/949,423 entitled <i>System and Method for Registering Complex Images</i> filed by X. Long Dai, et al. on September 7, 2001. 25 Pages.					09/07/01
	Q						
	R						
	S						
	T						
EXAMINER					DATE CONSIDERED		
EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.							

PTO-1449

**Information Disclosure Citation  
in an Application**

Application No.	Applicant(s)	
Not yet assigned	Clarence E. Thomas, et al.	
Docket Number	Group Art Unit	Filing Date
068062.0168	Not Yet Assigned	September 12, 2003

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**FOREIGN PATENT DOCUMENTS**

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	NO
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N							
O							
P							
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**NON-PATENT DOCUMENTS**

	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
P	U.S. Patent Application Serial No. 09/949,423 entitled <i>System and Method for Registering Complex Images</i> filed by X. Long Dai, et al. on September 7, 2001. 25 Pages.	09/07/01
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EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.